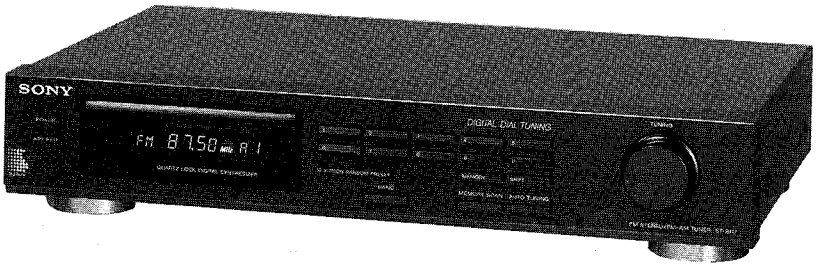
ST-S117

SERVICE MANUAL

AEP Model



SPECIFICATIONS

Tuner

Circuit system	FM stereo, FM/AM superheterodyne tuner Quartz-locked PLL digital synthesizer system

FM tuner

Frequency range	87.5 – 108 MHz
Antenna terminals	75 ohms unbalanced
Intermediate frequency	10.7MHz
Sensitivity	18.0 dBf, 2.2 μ V (mono) 40.0 dBf, 24.5 μ V (stereo) (at 46 dB quieting)
Signal-to-noise ration	74 dB (mono) 69 dB (stereo) (at 40 kHz deviation)
Harmonic distortion	0.3% (mono), 0.5% (stereo) (at 1 kHz)
Separation	40 dB (at 1kHz)
Frequency response	40 Hz – 12.5 kHz ± 0.5dB
Selectivity	55 dB (at 400 kHz)
Capture ratio	1.0 dB
AM suppression ratio	54 dB
Image response tatio	50 dB
IF response ratio	90 dB
Spurious response ratio	70 dB
Automatic tuning threshold	17.8 μ V (30 dBf)
Output	410 mV, 4.7 kohms (at 40 kHz deviation)

AM tuner

Frequency range	MW : 531 – 1,602 kHz LW : 153 – 279 kHz
Antenna	AM loop antenna External antenna terminal
Intermediate frequency	450kHz
Usable sensitivity (with AM loop antenna)	300 μ V/m (999 kHz) 1mV/m (216 kHz)
Signal-to-noise ratio	54 dB (50 mV/m) (999 kHz) 50 dB (50 mV/m) (216 kHz)
Harmonic distortion	0.5% (50 mV/m, 400 Hz)
Selectivity	32 dB

General

Power requirements	220 – 230V AC (or 240V AC adjustable by authorized Sony personnel), 50/60Hz
Power consumption	8 W
Dimensions	Approx. 430 × 85 × 295 mm (w/h/d) (17 × 3 3/8 × 11 5/8 inches)
Weight	Approx. 2.8 kg (6 lb 3 oz)
Accessories supplied	Remote control cord (1) Connecting cord (1) FM antenna (1) AM loop antenna (1)

Design and specifications subject to change without notice.

MICROFILM

FM STEREO/FM-AM TUNER

SONY®

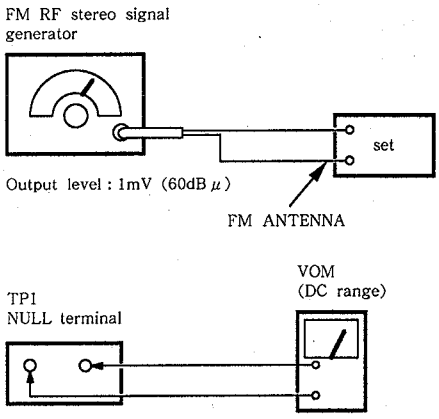
SECTION 1
ELECTRICAL ADJUSTMENTS

FM SECTION

SSG	Carrier frequency	98MHz
	Modulation	MONO : 1kHz, 40kHz deviation
		STEREO : Audio 1kHz, 16.25kHz deviation Pilot 19kHz, 7.5kHz deviation Sub-carrier 38kHz, 16.25kHz deviation

• FM Discriminator Alignment (NULL check)

Setting :



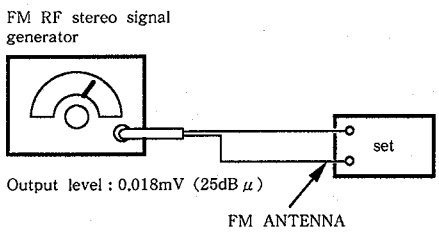
Procedure :

1. Tune the set to 98MHz.
2. Adjust T21 for 0V reading on the VOM.

Note : FM tuning level adjustment should be made after FM discriminator alignment.

• FM Tuning Level Adjustment

Setting :

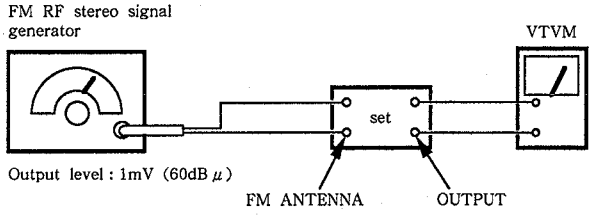


Procedure :

1. Tune the set to 98MHz.
2. Adjust RV24 so that the TUNED LED goes on.

• FM Stereo Separation Adjustment

Setting :



Procedure :

Tune the set to 98MHz

FM stereo Signal generator Output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV21 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV21 for minimum reading.

L-CH Stereo separation : Ⓐ − Ⓑ
R-CH Stereo separation : Ⓒ − Ⓓ

The separations of both channels should be equal.

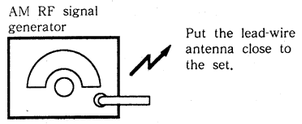
AM SECTION

• AM Tuning Level Adjustment

Setting :

BAND selector : LW

Procedure :



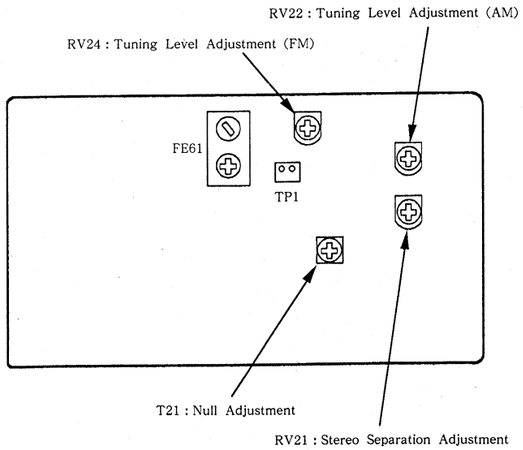
Carrier frequency : 216kHz

30% amplitude modulation by 400Hz signal
Output level : 68dB μ

1. Tune the set to 216kHz
2. Adjust the RV22 so that the TUNED LED goes on.

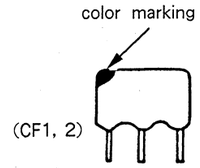
Parts Arrangement Diagram for Adjustments

—tuner board—



Note on Ceramic Filter (CF1, 2) Replacement.

This set employs three ceramic filters (CF1, 2) which should have the same color marking to identify their center frequency. Therefore FM IF offset adjustment by D708, D709 mounted is necessary to match the center frequency of the ceramic filters used with FM intermediate frequency.



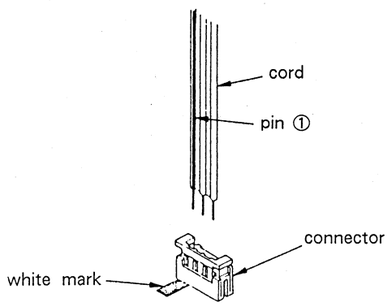
○ : Mounted
× : not Mounted

Ceramic filter		Mount		FM intermediate frequency (MHz)
Color mark	Center frequency (MHz)	*A D708	*B D709	
White	10.750	×	○	10.750
Red	10.700	○	○	10.700
Black	10.650	○	×	10.650

FM intermediate frequency is determined by the three types as shown above. Ceramic filters of same center frequency, i.e., of same color coding should be used for CF1 and CF2. When replacing the ceramic filters, perform the FM Discriminator Adjustment.

[Note on Inserting the Cord to the Connector on Tuner Board]

- Insert the cord to the connector fitting Pin ① of the cord in accordance with the white mark on the board at the connector as shown in the figure.



SECTION 2
EXPLANATION OF IC TERMINALS

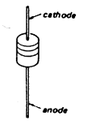
TMP47C670N-1247 is a hight-speed, hight-functional 4 bit single chip microcomputer with a built-in fluorescent display lamp drive circuit, a 4 bit A/D conversion input, and a 14 bit D/A conversion output.

PIN FUNCTIONS

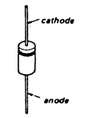
Pin.No	Pin Name	I/O	Function
1	VKK	Power	Power terminal for fluorescent display lamp drive
2–11	S0–S9	O	FL lamp segment output
14	CINO	I	Signal input
15	K01	I	Key input
16	K02	I	Key input
17	K03	I	Key input
18	TEST	I	Terminal for shipping test (Not used on the set)
19	X IN	I	Oscillator connection terminal (Hight frequency)
20	X OUT	O	
21	$\overline{\text{RESET}}$	I	Reset signal input
22	$\overline{\text{HOLD}}$	I	Demand/release signal input for hold operation
24	R60	I	Key input
25	R60	I	Key input
27	R63	I	Signal meter level conversion
28	P10	O	Key output
29	P11	O	Key output
30	P12	O	Key output
31	P13	O	Key output
32	VSS	Power	GND (0V)
33	P20	O	Key output
34	P21	O	Key output
35	P22	O	Key output
37	R70	I	AUTO STOP level input TUNED input
39	R72	O	MUTING input
40	R73	I	STEREO input
41	$\overline{\text{INT2}}$	I	Remote controller input
42	R81	I	Rotary encoder input
43	R82	I	Rotary encoder input
44	R83	O	CE output
45	SI	I	Serial data input
46	SO	O	Serial data output
47	$\overline{\text{SCK}}$	O	Serial clock output
54–62		O	FL lamp digit output
64	VDD	Power	+5V

• SEMICONDUCT

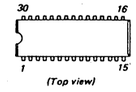
EQA02-06C
RD30ES-B3
1SS120



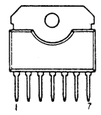
10E2N



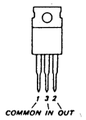
LA1851N



LA5667



LC7218



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×	10.650

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Connector on Tuner

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ord

n ①

connector

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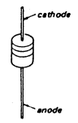
45	SI	I	Serial data input
46	SO	O	Serial data output
47	$\overline{\text{SCK}}$	O	Serial clock output
54−62		O	FL lamp digit output
64	VDD	Power	+5V

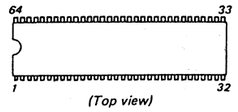
SECTION 3
DIAGRAMS

• SEMICONDUCTOR LEAD LAYOUTS

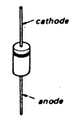
EQA02-06C
RD30ES-B3
1SS120



TMP47C670N-1247

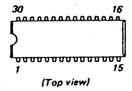


10E2N



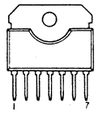
DTA114ES
DTC114ES
2SA1317-STU
2SC2603-EF
2SC2669-OY

LA1851N



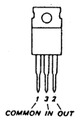
2SC2785-HFE

LA5667



2SC3113-AB

LC7218



3-1. PRINTED WIRING BOARDS

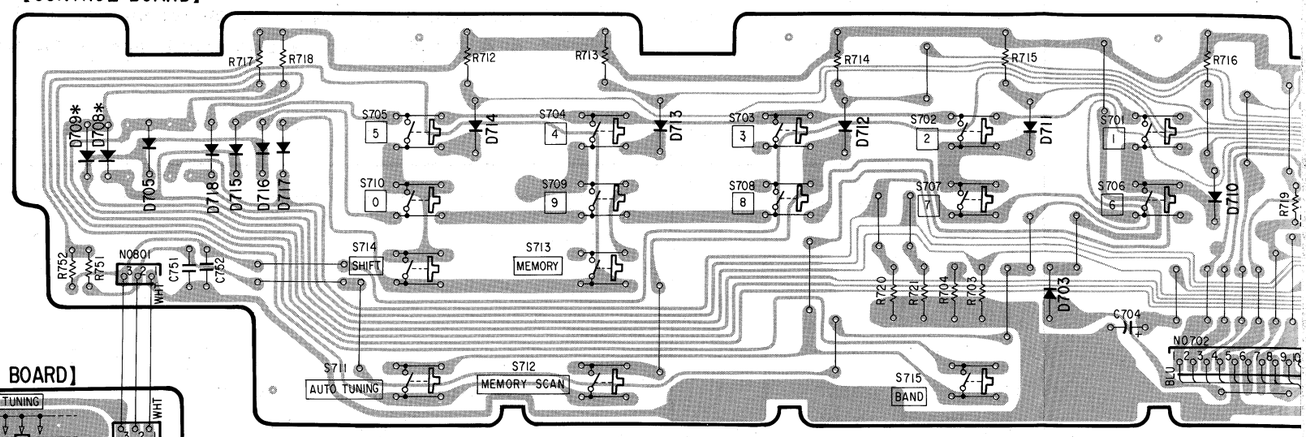
• SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
IC21	G-14	D501	G-5
IC81	E-11	D502	F-5
IC501	G-6	D503	F-6
IC701	B-14	D504	F-6
		D505	F-7
Q1	F-11	D506	F-7
Q2	F-12	D507	H-6
Q21	F-15	D701	B-16
Q22	F-15	D702	C-11
Q26	H-15	D703	B-10
Q27	F-15	D705	B-5
Q28	G-15	D708	B-4
Q61	G-12	D709	B-4
Q62	G-12	D710	B-11
Q63	G-12	D711	B-11
Q64	G-11	D712	B-9
Q65	G-13	D713	B-8
Q81	E-13	D714	B-7
Q82	F-13	D715	B-5
Q83	E-10	D716	B-5
Q84	E-10	D717	B-5
Q85	E-10	D718	B-5
Q86	E-9		
D21	G-15		
D22	G-15		
D23	G-16		
D24	G-16		
D61	G-12		

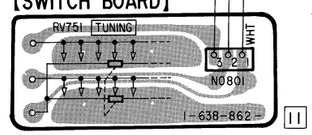
Note :

- ○— : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- [▯]← indicates side identified with part number.

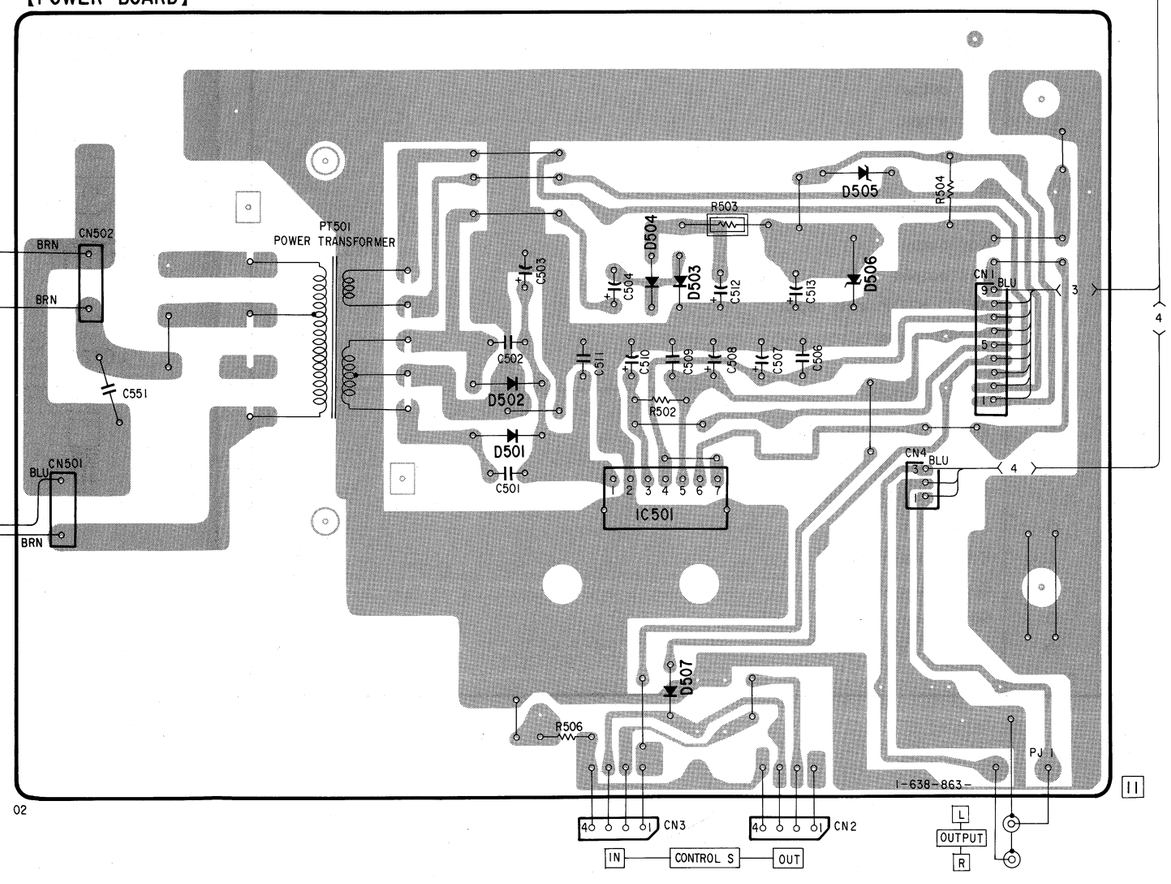
【CONTROL BOARD】



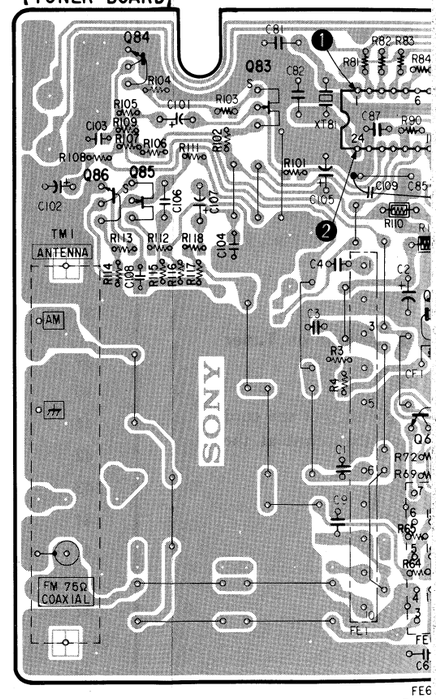
【SWITCH BOARD】



【POWER BOARD】

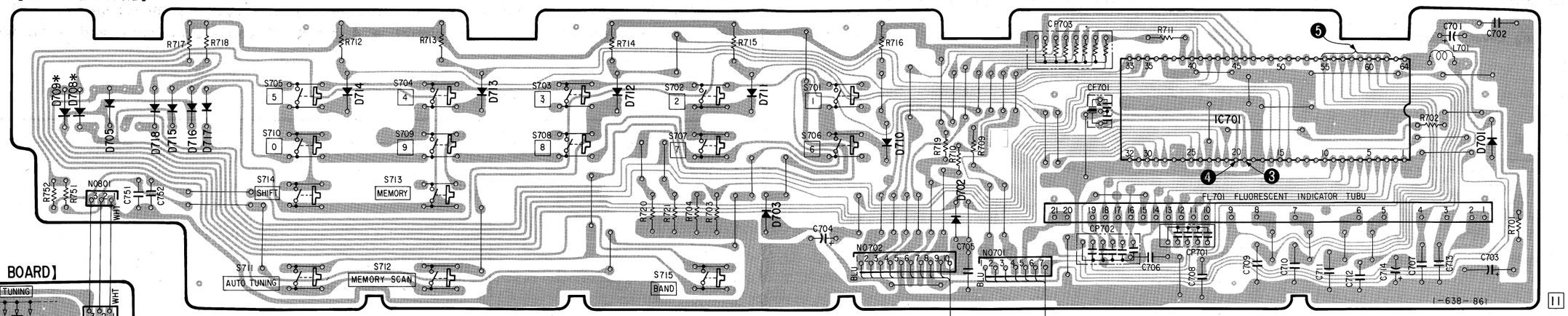


【TUNER BOARD】

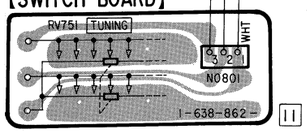


2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

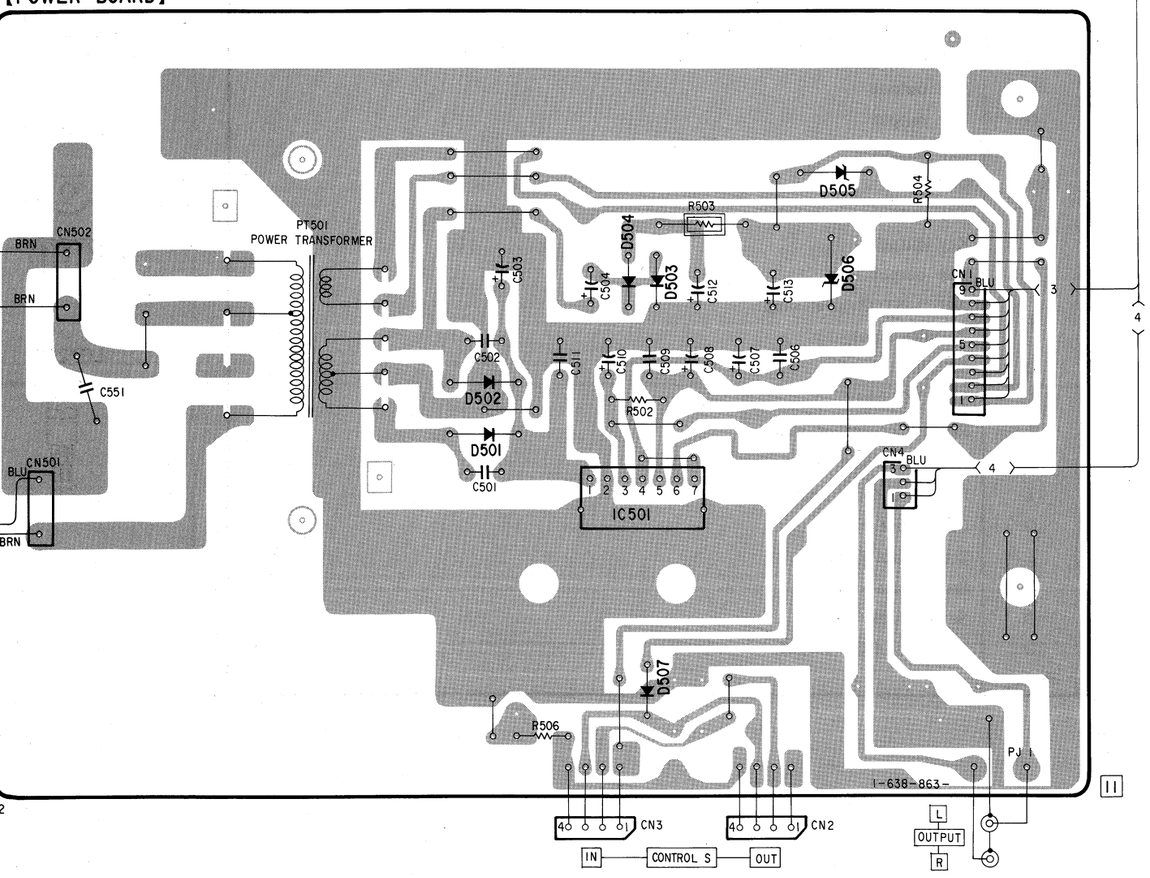
【CONTROL BOARD】



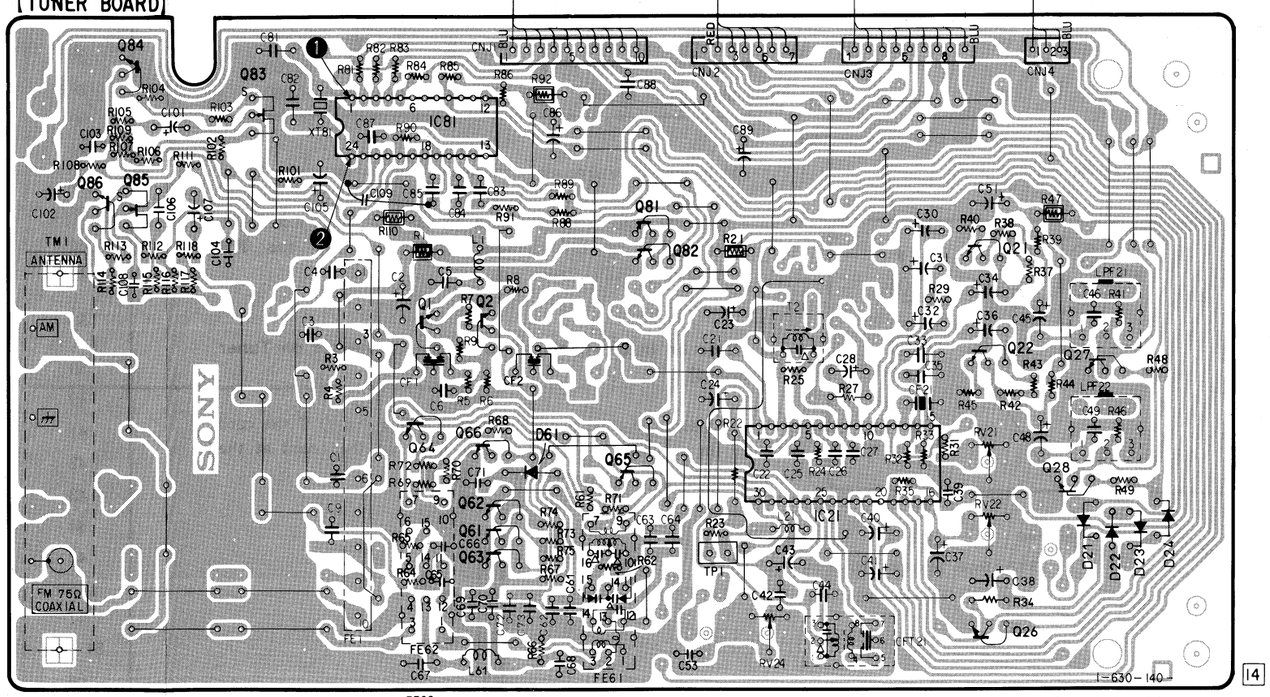
【SWITCH BOARD】



【POWER BOARD】



【TUNER BOARD】



【TUNER BOARD】

TO POWER BOARD CN4 — CNJ4

Q1 2SC2669 / Q2 2SC2669 FM IF AMP

Q3 2SC2669 / Q4 2SC2669 FM IF AMP

FE1 FM FRONT-END
FM: 1.9 - 7.6V
ANT IN · GND · AGC · GND · VT · GND · IF OUT · B+ · GND · F OUT

TM1
FM 75Ω COAXIAL
ANTENNA
G
AM

IC21
LA1851N
FM DET, MPX
AM IF, DET

RV24 FM TUNED

RV22 AM TUNED

RV21 STEREO SEPARATION

Q21 2SC2603 / Q22 2SC2603 PRE AMP

LPF22 · LPF21

MUTING: 0.6

D22 · D23 · D24

Q27 · Q28 2SC2785 MUTING

R49 100k

Q26 2SC3402 MUTE

D21-24 US1060M

D21

FE62 LW BLOCK

Q64 2SC3330 LW SWITCH

Q63 2SC3402 LW SWITCH

Q65 2SA1317 MW SWITCH

FE61 MW BLOCK

Q66 2SC3402 BAND SWITCH

Q62 2SC3402 MW SWITCH

Q61 2SC3402 MW SWITCH

LW 1.7 - 6V

MW: 1.3 - 7.8V

Q81, 82 FM B+ SWITCH

Q81 2SA1318

Q82 2SC3402

IC81 LC7218 PLL

Q83 2SK246 GR3 / Q84 2SC3113A LPF

Q85 2SK246 GR3 / Q86 2SC3113A LPF

CNJ1 — CE · DI · CL · DO · GND · TUNED · STEREO · 5V · HOLD · 1.3V

CNJ2 — MUTTING · REMOCON · VF · VF · -30V

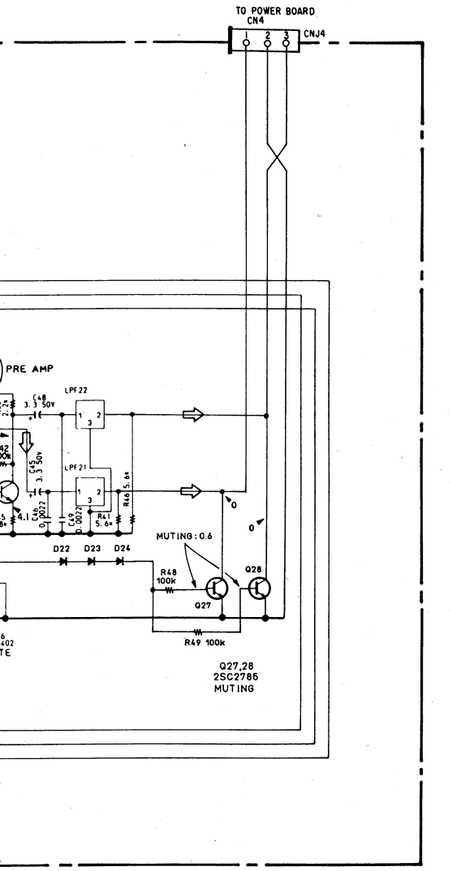
CNJ3 — VG · VF · VF · REMOCON · HOLD · 5V · 1.3V · GND · MUTTING

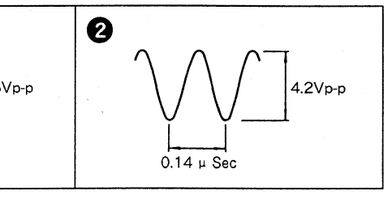
A TO CONTROL BOARD CN702

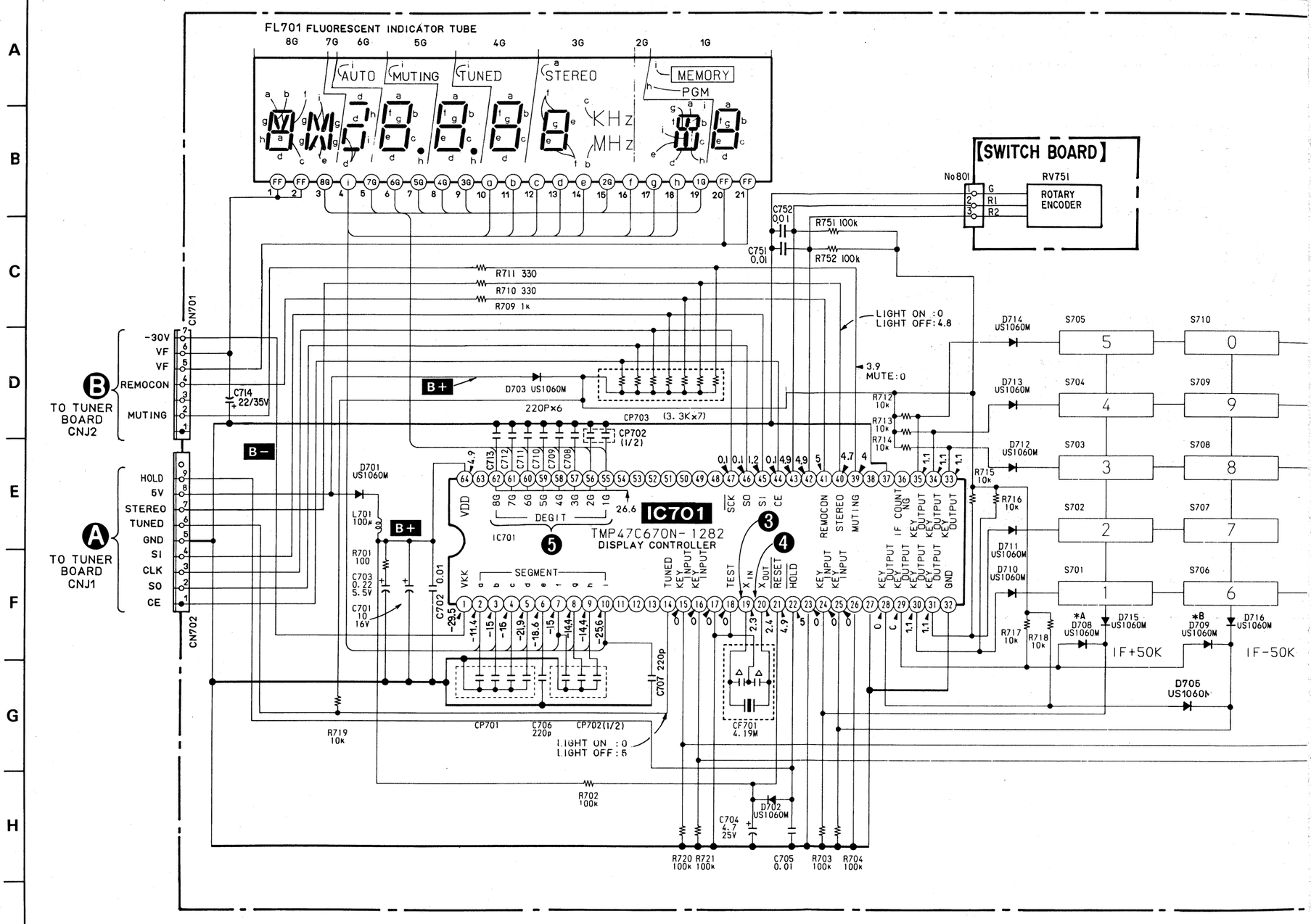
B TO CONTROL BOARD CN701

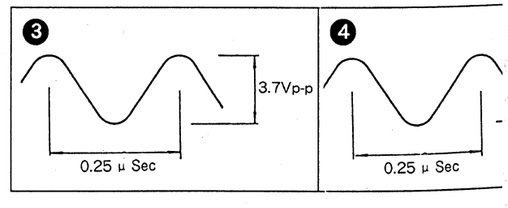
C TO POWER BOARD CN1

❶	❷
3.5Vp-p, 0.14 μ Sec	4.2Vp-p, 0.14 μ Sec


TO POWER BOARD
CN4
CNJ4
PRE AMP
LPF22
LPF21
D22
D23
D24
MUTING: 0.6
R48
100k
Q28
Q27
R49 100k
Q27,28
2SC2785
MUTING


Vp-p
2
4.2Vp-p
0.14 μ Sec

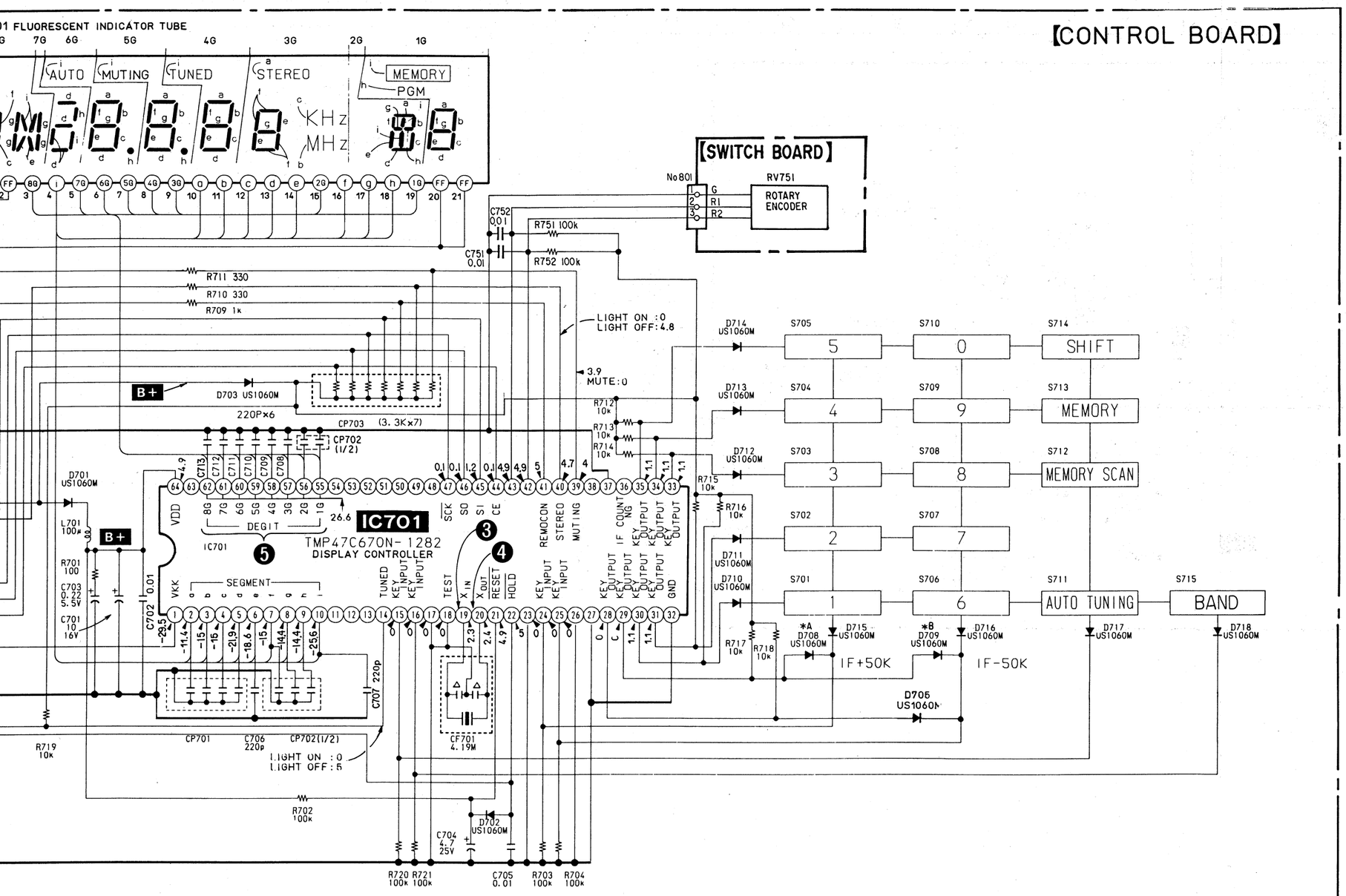

FL701 FLUORESCENT INDICATOR TUBE
AUTO
MUTING
TUNED
STEREO
MEMORY
PGM
KHz
MHz
[SWITCH BOARD]
No801
RV751
ROTARY ENCODER
G
R1
R2
C752 0.01
C751 0.01
R751 100k
R752 100k
R711 330
R710 330
R709 1k
LIGHT ON : 0
LIGHT OFF: 4.8
3.9
MUTE: 0
CN701
-30V
VF
VF
REMOCON
MUTING
TO TUNER BOARD CNJ2
B+
B−
D703 US1060M
220P×6
CP703 (3.3K×7)
CP702 (1/2)
C714 22/35V
HOLD
5V
STEREO
TUNED
GND
SI
CLK
SO
CE
TO TUNER BOARD CNJ1
CN702
D701 US1060M
L701 100μ
R701 100
C703 0.22 5.5V
C701 10 16V
C702 0.01
IC701
TMP47C670N-1282
DISPLAY CONTROLLER
DEGIT
SEGMENT
VDD
VKK
SCK
SO
SI
CE
TEST
X IN
X OUT
RESET
HOLD
REMOCON
STEREO
MUTING
IF COUNTER NG
KEY INPUT
KEY OUTPUT
GND
D714 US1060M
D713 US1060M
D712 US1060M
D711 US1060M
D710 US1060M
S705
S710
S704
S709
S703
S708
S702
S707
S701
S706
5
0
4
9
3
8
2
7
1
6
R712 10k
R713 10k
R714 10k
R715 10k
R716 10k
R717 10k
R718 10k
*A D708 US1060M
D715 US1060M
*B D709 US1060M
D716 US1060M
IF+50K
IF-50K
D705 US1060M
R719 10k
CP701
C706 220p
CP702(1/2)
LIGHT ON : 0
LIGHT OFF : 5
C707 220p
CF701 4.19M
R702 100k
D702 US1060M
C704 4.7 25V
C705 0.01
R720 100k
R721 100k
R703 100k
R704 100k


3
3.7Vp-p
0.25 μ Sec
4
0.25 μ Sec

ection —

3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15

【CONTROL BOARD】



Note :

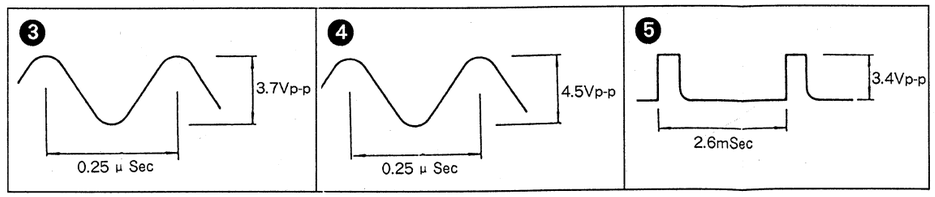
- ＊A, ＊B : See page 4 Note on Ceramic Filter (CF1, 2) Replacement.
- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- △ : internal component.
- ▭ : nonflammable resistor.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

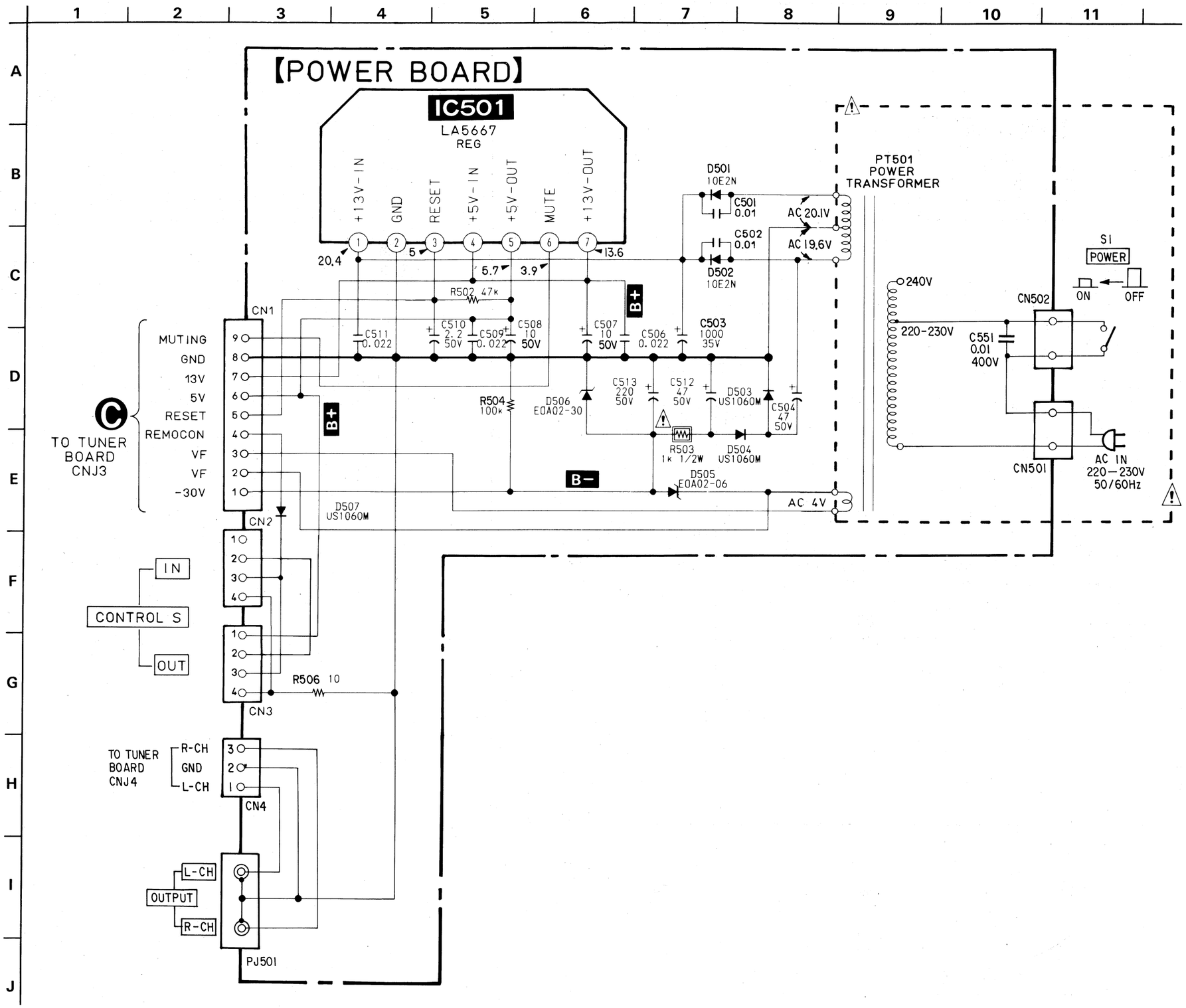
- B+ : B+ Line
- B− : B− Line
- ▭ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : FM
  ( ) : AM or MW
  〈 〉 : LW
- Voltages are taken with a VOM (Input impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM

[Service Note]

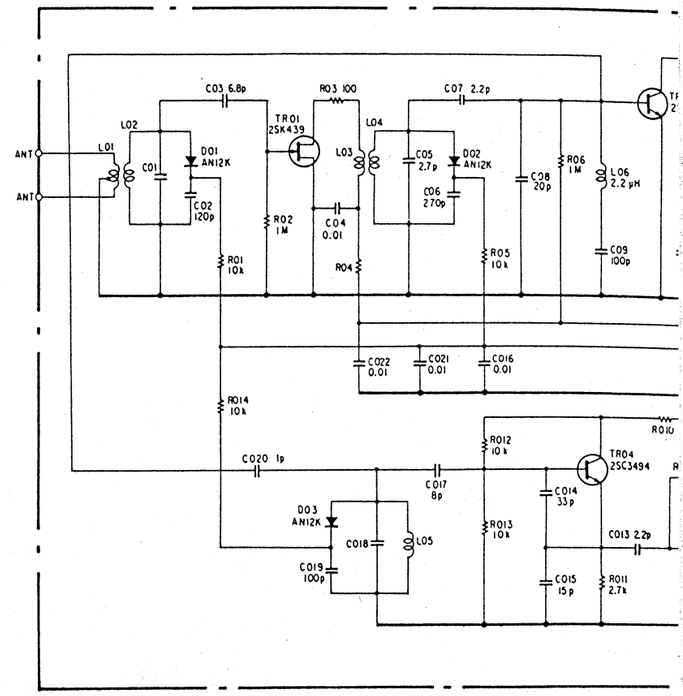
INDICATOR TUBE ALL LIGHT-UP MODE
When turning POWER switch on while pressing PRESET 1 and AUTO TUNING KEYS simultaneously, all the segments of FL701 will light.

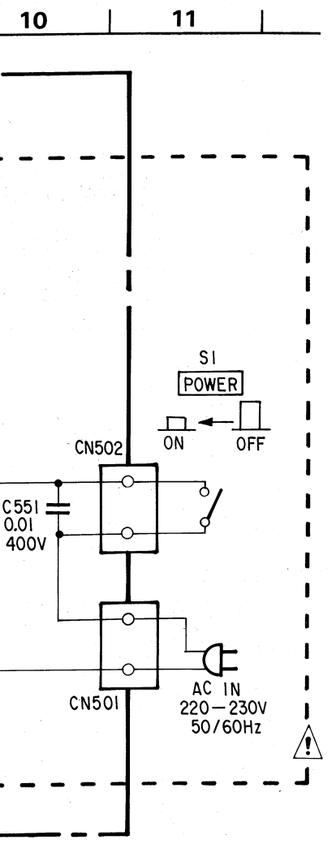


3-4. SCHEMATIC DIAGRAM —Power Section— • Refer to page 13 for note.

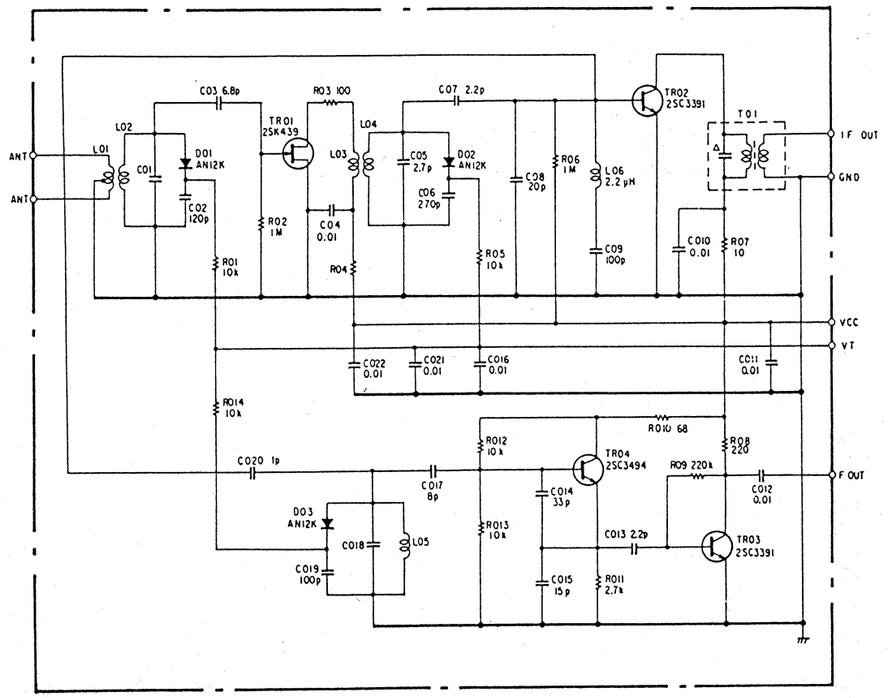


3-5. FE1 (FRONT END) SCHEMATIC DIAGRAM



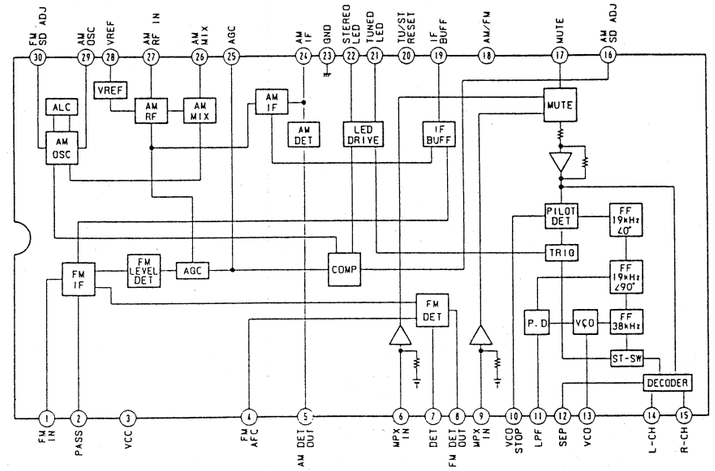


3-5. FE1 (FRONT END) SCHEMATIC DIAGRAM

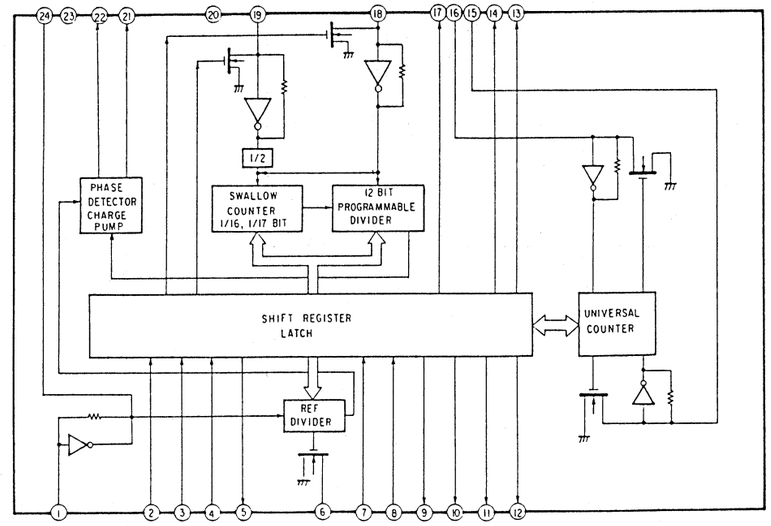


• IC BLOCK DIAGRAMS

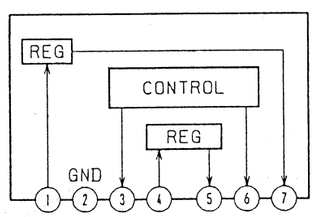
IC21 LA1851N



IC81 LC7218

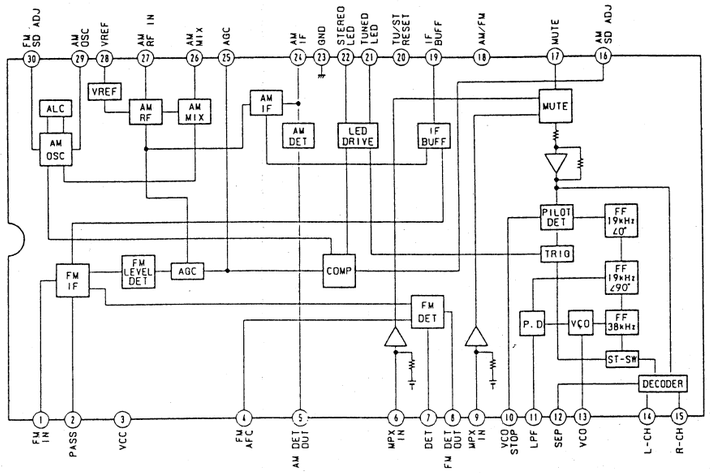


IC501 LA5667

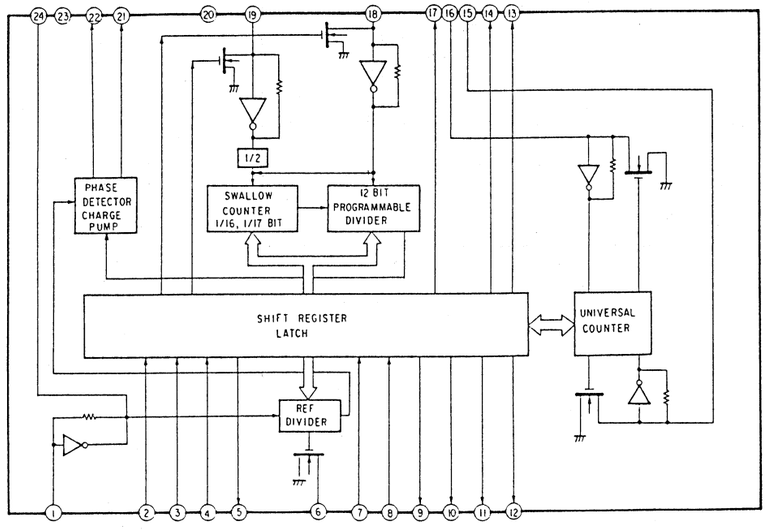


• IC BLOCK DIAGRAMS

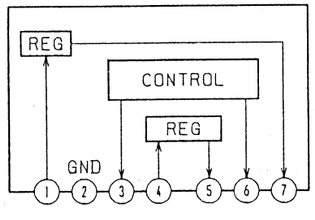
IC21 LA1851N



IC81 LC7218



IC501 LA5667

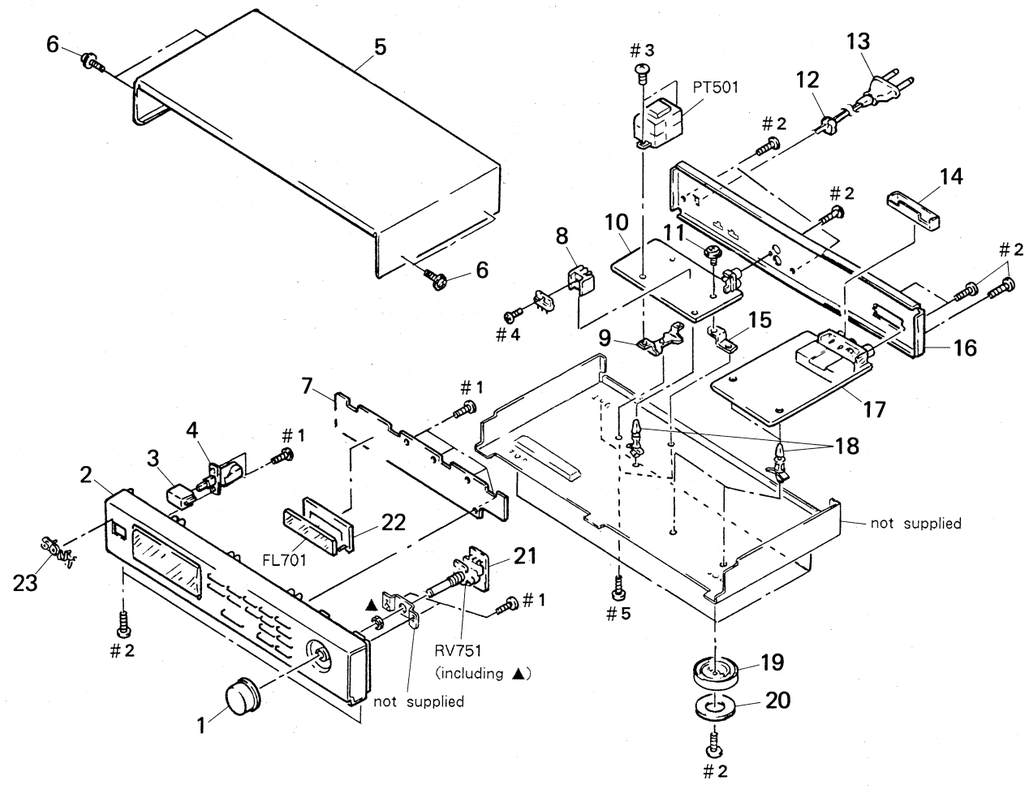


SECTION 4
EXPLODED VIEW

NOTE:

- −XX, −X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE)....(RED)
  ↑ Parts color ↑ Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.



Ref. No.	Part No.	Description	Remark
1	4-945-523-01	KNOB (TUNE)	
2	X-4941-649-1	PANEL ASSY, FRONT	
3	3-354-912-01	KNOB, POWER	
4	1-554-920-21	SWITCH, PUSH (AC POWER) (1 KEY)	
5	4-923-457-01	CASE	
6	3-704-366-01	SCREW (CASE) (M3X8)	
7	* A-4345-162-A	CONTROL BOARD, COMPLETE	
8	* 4-363-146-31	HEAT SINK, V.OUT	
9	* 4-917-044-01	BRACKET (PT)	
10	* 1-638-863-11	POWER BOARD	
11	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6	
12	* 3-703-244-00	BUSHING (2104), CORD	
13	⚠ 1-575-651-11	CORD, POWER	
14	* 4-924-988-11	PLATE (ST), GROUND	
15	* 3-332-563-01	BRACKET (P)	
16	4-944-121-61	PANEL, BACK (AE1)	
16	4-944-121-91	PANEL, BACK (AE2)	
17	* A-4345-492-A	TUNER BOARD, COMPLETE	
18	* 3-346-265-11	HOLDER, PC BOARD	
19	X-3304-938-2	FOOT ASSY	
20	4-923-836-11	CUSHION	
21	* 1-638-862-11	SWITCH BOARD	
22	* 4-495-525-01	HOLDER (FL)	
23	4-925-334-11	EMBLEM (5-A), SONY	
FL701	1-519-512-11	INDICATOR TUBE, FLUORESCENT	
PT501	⚠ 1-450-009-11	TRANSFORMER, POWER	
RV751	1-466-513-11	ENCODER, ROTARY (TUNING)	

SECTION 5
ELECTRICAL PARTS LIST

CONTROL

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- —XX, —X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA....: μA...., uPA....: μPA....
  uPB....: μPB...., uPC....: μPC....
  uPD....: μPD....
- CAPACITORS
  uF: μF
- COILS
  uH: μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref. No.	Part No.	Description			Remark
	A-4345-162-A	CONTROL BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C701	1-126-157-11	ELECT	10uF	20%	16V
C702	1-161-379-00	CERAMIC	0.01uF	20%	25V
C703	1-125-486-11	DUBLE LAYERS	0.22F		5.5V
C704	1-126-163-11	ELECT	4.7uF	20%	50V
C705	1-161-379-00	CERAMIC	0.01uF	20%	25V
C706	1-162-286-31	CERAMIC	220PF	10%	50V
C707	1-162-286-31	CERAMIC	220PF	10%	50V
C708	1-162-286-31	CERAMIC	220PF	10%	50V
C709	1-162-286-31	CERAMIC	220PF	10%	50V
C710	1-162-286-31	CERAMIC	220PF	10%	50V
C711	1-162-286-31	CERAMIC	220PF	10%	50V
C712	1-162-286-31	CERAMIC	220PF	10%	50V
C713	1-162-286-31	CERAMIC	220PF	10%	50V
C714	1-123-357-00	ELECT	22uF	20%	35V
C751	1-161-379-00	CERAMIC	0.01uF	20%	25V
C752	1-161-379-00	CERAMIC	0.01uF	20%	25V
		< FILTER >			
CF701	1-577-359-21	VIBRATOR, CERAMIC (4.19MHz)			
		< CIRCUIT BLOCK >			
CP701	1-233-148-11	COMPOSITION CIRCUIT BLOCK			
CP702	1-233-187-11	COMPOSITION CIRCUIT BLOCK			
CP703	1-233-185-11	COMPOSITION CIRCUIT BLOCK			
		< DIODE >			
D701	8-719-912-20	DIODE 1SS120			
D702	8-719-912-20	DIODE 1SS120			
D703	8-719-912-20	DIODE 1SS120			
D705	8-719-912-20	DIODE 1SS120			
D708	8-719-912-20	DIODE 1SS120			
D709	8-719-912-20	DIODE 1SS120			
D710	8-719-912-20	DIODE 1SS120			
D711	8-719-912-20	DIODE 1SS120			
D712	8-719-912-20	DIODE 1SS120			
D713	8-719-912-20	DIODE 1SS120			
D714	8-719-912-20	DIODE 1SS120			
D715	8-719-912-20	DIODE 1SS120			
D716	8-719-912-20	DIODE 1SS120			
D717	8-719-912-20	DIODE 1SS120			
D718	8-719-912-20	DIODE 1SS120			
		< FILTER >			
FL701	1-519-512-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC701	8-759-246-23	IC TMP47C670N-1247			
		< COIL >			
L701	1-410-521-11	INDUCTOR	100uH		
		< RESISTOR >			
R701	1-249-405-11	CARBON	100	5%	1/4W
R702	1-249-441-11	CARBON	100K	5%	1/4W
R703	1-249-441-11	CARBON	100K	5%	1/4W
R704	1-249-441-11	CARBON	100K	5%	1/4W
R709	1-249-417-11	CARBON	1K	5%	1/4W
R710	1-249-411-11	CARBON	330	5%	1/4W
R711	1-249-411-11	CARBON	330	5%	1/4W
R712	1-249-429-11	CARBON	10K	5%	1/4W
R713	1-249-429-11	CARBON	10K	5%	1/4W
R714	1-249-429-11	CARBON	10K	5%	1/4W

CONTROL SWITCH POWER TUNER

Ref. No.	Part No.	Description			Remark
R715	1-249-429-11	CARBON	10K	5%	1/4W
R716	1-249-429-11	CARBON	10K	5%	1/4W
R717	1-249-429-11	CARBON	10K	5%	1/4W
R718	1-249-429-11	CARBON	10K	5%	1/4W
R719	1-249-429-11	CARBON	10K	5%	1/4W
R720	1-249-441-11	CARBON	100K	5%	1/4W
R721	1-249-441-11	CARBON	100K	5%	1/4W
R751	1-249-441-11	CARBON	100K	5%	1/4W
R752	1-249-441-11	CARBON	100K	5%	1/4W
		< SWITCH >			
S701	1-554-303-21	SWITCH, TACTILE ([1])			
S702	1-554-303-21	SWITCH, TACTILE ([2])			
S703	1-554-303-21	SWITCH, TACTILE ([3])			
S704	1-554-303-21	SWITCH, TACTILE ([4])			
S705	1-554-303-21	SWITCH, TACTILE ([5])			
S706	1-554-303-21	SWITCH, TACTILE ([6])			
S707	1-554-303-21	SWITCH, TACTILE ([7])			
S708	1-554-303-21	SWITCH, TACTILE ([8])			
S709	1-554-303-21	SWITCH, TACTILE ([9])			
S710	1-554-303-21	SWITCH, TACTILE ([0])			
S711	1-554-303-21	SWITCH, TACTILE (AUTO TUNING)			
S712	1-554-303-21	SWITCH, TACTILE (MEMORY SCAN)			
S713	1-554-303-21	SWITCH, TACTILE (MEMORY)			
S714	1-554-303-21	SWITCH, TACTILE (SHIFT)			
S715	1-554-303-21	SWITCH, TACTILE (BAND)			
**********					
*	1-638-862-11	SWITCH BOARD			
		**********			
		< VARIABLE RESISTOR >			
RV751	1-466-513-11	ENCODER, ROTARY (TUNING)			
**********					
*	1-638-863-11	POWER BOARD			
		**********			
*	4-363-146-31	HEAT SINK, V.OUT			
*	4-945-525-01	HOLDER (FL)			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2			
		< CAPACITOR >			
C501	1-101-004-00	CERAMIC	0.01uF		50V
C502	1-101-004-00	CERAMIC	0.01uF		50V
C503	1-126-105-11	ELECT	1000uF	20%	35V
C504	1-124-910-11	ELECT	47uF	20%	50V
C506	1-101-005-00	CERAMIC	22000PF		50V
C507	1-124-907-11	ELECT	10uF	20%	50V

Ref. No.	Part No.	Description			Remark
C508	1-124-907-11	ELECT	10uF	20%	50V
C509	1-101-005-00	CERAMIC	22000PF		50V
C510	1-124-925-11	ELECT	2.2uF	20%	100V
C511	1-101-005-00	CERAMIC	22000PF		50V
C512	1-124-910-11	ELECT	47uF	20%	50V
C513	1-124-911-11	ELECT	220uF	20%	50V
C551	⚠ 1-161-744-00	CERAMIC	0.01uF		400V
		< CONNECTOR >			
CN1	* 1-568-284-11	SOCKET, CONNECTOR 9P			
CN2	1-564-980-11	PIN, CONNECTOR 4P			
CN3	1-564-980-11	PIN, CONNECTOR 4P			
CN4	1-568-269-11	SOCKET, CONNECTOR 3P			
CN501	* 1-564-321-00	PIN, CONNECTOR 2P			
CN502	* 1-564-321-21	PIN, CONECTOR 2P			
		< DIODE >			
D501	8-719-200-77	DIODE 10E2N			
D502	8-719-200-77	DIODE 10E2N			
D503	8-719-912-20	DIODE 1SS120			
D504	8-719-912-20	DIODE 1SS120			
D505	8-719-912-81	DIODE EQA02-06C			
D506	8-719-110-73	DIODE RD30ESB3			
D507	8-719-912-20	DIODE 1SS120			
		< IC >			
IC501	8-759-820-09	IC LA5667			
		< JACK >			
PJ501	1-565-352-11	JACK, PIN 2P			
		< TRANSFORMER >			
PT501	⚠ 1-450-009-11	TRANSFORMER, POWER			
		< RESISTOR >			
R502	1-249-437-11	CARBON	47K	5%	1/4W
R503	⚠ 1-247-752-11	CARBON	1K	5%	1/2W F
R504	1-249-441-11	CARBON	100K	5%	1/4W
R506	1-249-393-11	CARBON	10	5%	1/4W
**********					
*	A-4345-492-A	TUNER BOARD, COMPLETE			
		**********			
	1-589-204-11	MOUNTED BOARD			
*	4-924-988-11	PLATE (ST), GROUND			

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
		< CAPACITOR >			
C1	1-162-294-31	CERAMIC CHIP	0.001uF	20%	25V
C2	1-124-477-11	ELECT	47uF	20%	25V
C3	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C4	1-162-294-31	CERAMIC CHIP	0.001uF	20%	25V
C5	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C6	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C9	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C21	1-101-006-00	CERAMIC	0.047uF		50V
C22	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C23	1-124-477-11	ELECT	47uF	20%	25V
C24	1-123-382-00	ELECT	3.3uF	20%	100V
C25	1-163-063-00	CERAMIC MELF	0.022uF		25V
C26	1-163-019-00	CERAMIC MELF	0.0068uF	20%	12V
C27	1-162-516-11	CERAMIC CHIP	100PF	10%	50V
C28	1-124-903-11	ELECT	1uF	20%	50V
C30	1-124-903-11	ELECT	1uF	20%	50V
C31	1-124-902-00	ELECT	0.47uF	20%	50V
C32	1-124-463-00	ELECT	0.1uF	20%	50V
C33	1-130-481-00	MYLAR	0.0068uF	5%	50V
C34	1-123-382-00	ELECT	3.3uF	20%	100V
C35	1-130-481-00	MYLAR	0.0068uF	5%	50V
C36	1-123-382-00	ELECT	3.3uF	20%	100V
C37	1-124-907-11	ELECT	10uF	20%	50V
C38	1-124-907-11	ELECT	10uF	20%	50V
C39	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C40	1-124-463-00	ELECT	0.1uF	20%	50V
C41	1-124-927-11	ELECT	4.7uF	20%	100V
C42	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C43	1-126-176-11	ELECT	220uF	20%	10V
C44	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C45	1-123-382-00	ELECT	3.3uF	20%	100V
C46	1-163-059-00	CERAMIC MELF	0.0022uF	20%	25V
C48	1-123-382-00	ELECT	3.3uF	20%	100V
C49	1-161-375-00	CERAMIC MELF	0.0022uF	20%	25V
C51	1-124-477-11	ELECT	47uF	20%	25V
C53	1-163-467-11	CERAMIC CHIP	33PF	5%	50V
C61	1-163-063-00	CERAMIC MELF	0.022uF		25V
C62	1-163-063-00	CERAMIC MELF	0.022uF		25V
C63	1-163-063-00	CERAMIC MELF	0.022uF		25V
C64	1-163-063-00	CERAMIC MELF	0.022uF		25V
C65	1-163-063-00	CERAMIC MELF	0.022uF		25V
C66	1-163-063-00	CERAMIC MELF	0.022uF		25V
C67	1-102-120-00	CERAMIC	0.0018uF	10%	50V
C68	1-162-523-11	CERAMIC CHIP	0.0015uF	20%	25V
C69	1-163-063-00	CERAMIC CHIP	0.022uF		25V
C70	1-163-063-00	CERAMIC CHIP	0.022uF		25V

Ref. No.	Part No.	Description			Remark
C71	1-163-063-00	CERAMIC CHIP	0.022uF		25V
C72	1-163-063-00	CERAMIC CHIP	0.022uF		25V
C73	1-163-063-00	CERAMIC CHIP	0.022uF		25V
C81	1-102-961-00	CERAMIC	27PF	5%	50V
C82	1-102-961-00	CERAMIC	27PF	5%	50V
C83	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C84	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C85	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C86	1-124-477-11	ELECT	47uF	20%	25V
C87	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C88	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C101	1-124-925-11	ELECT	2.2uF	20%	100V
C102	1-124-463-00	ELECT	0.1uF	20%	50V
C103	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C104	1-163-059-00	CERAMIC MELF	0.01uF	20%	16V
C105	1-124-477-11	ELECT	47uF	20%	25V
C106	1-136-173-00	FILM	0.47uF	5%	50V
C107	1-124-463-00	ELECT	0.1uF	20%	50V
C108	1-163-063-00	CERAMIC CHIP	0.022uF		25V
C109	1-102-963-00	CERAMIC	33PF	5%	50V
		< FILTER >			
CF1	1-567-389-11	FILTER, CERAMIC			
CF2	1-567-389-11	FILTER, CERAMIC			
CF21	1-577-075-11	OSCILLATOR, CERAMIC			
CFT21	1-404-853-11	TRANSFORMER, IF (CERAMIC FILTER)			
		< CONNECTOR >			
CNJ1	* 1-564-666-11	PIN, CONNECTOR 10P			
CNJ2	* 1-564-341-11	PIN, CONNECTOR 7P			
CNJ3	* 1-568-313-11	SOCKET, CONNECTO 9P			
CNJ4	1-568-269-11	SOCKET, CONNECTOR 3P			
		< DIODE >			
D21	8-719-912-20	DIODE 1SS120			
D22	8-719-912-20	DIODE 1SS120			
D23	8-719-912-20	DIODE 1SS120			
D24	8-719-912-20	DIODE 1SS120			
D61	8-719-912-20	DIODE 1SS120			
		< FRONT END >			
FE1	1-463-862-21	FRONT END, FM			
FE61	1-236-462-11	ENCAPSULATED COMPONENT			
FE62	1-236-463-11	ENCAPSULATED COMPONENT			
		< IC >			
IC21	8-759-821-45	IC LA1851N			
IC81	8-759-820-91	IC LC7218			

TUNER

Ref. No.	Part No.	Description			Remark
		< COIL >			
L1	1-410-645-31	INDUCTOR	100uH		
L21	1-407-500-00	INDUCTOR	4.7mH		
L61	1-410-525-11	INDUCTOR	220uH		
		< FILTER >			
LPF21	1-235-164-00	FILTER, LOW PASS			
LPF22	1-235-164-00	FILTER, LOW PASS			
		< TRANSISTOR >			
Q1	8-729-230-XX	TRANSISTOR 2SC2669-OY			
Q2	8-729-230-XX	TRANSISTOR 2SC2669-OY			
Q21	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q22	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q26	8-729-900-80	TRANSISTOR DTC114ES			
Q27	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q28	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q61	8-729-900-80	TRANSISTOR DTC114ES			
Q62	8-729-900-80	TRANSISTOR DTC114ES			
Q63	8-729-900-80	TRANSISTOR DTC114ES			
Q64	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q65	8-729-821-04	TRANSISTOR 2SA1317-STU			
Q66	8-729-900-80	TRANSISTOR DTC114ES			
Q81	8-729-900-61	TRANSISTOR DTA114ES			
Q82	8-729-900-80	TRANSISTOR DTC114ES			
Q83	8-729-202-67	TRANSISTOR 2SK246GR3			
Q84	8-729-230-93	TRANSISTOR 2SC3113-AB			
Q85	8-729-202-67	TRANSISTOR 2SK246GR3			
Q86	8-729-230-93	TRANSISTOR 2SC3113-AB			
		< RESISTOR >			
R1	⚠ 1-249-401-11	CARBON	47	5%	1/4W
R3	1-249-329-11	CARBON MELF	330	5%	1/8W
R4	1-249-329-11	CARBON MELF	330	5%	1/8W
R5	1-249-329-11	CARBON MELF	330	5%	1/8W
R6	1-249-350-11	CARBON MELF	18K	5%	1/8W
R7	1-249-329-11	CARBON MELF	330	5%	1/8W
R8	1-249-332-11	CARBON MELF	560	5%	1/8W
R9	1-249-352-11	CARBON MELF	27K	5%	1/8W
R21	⚠ 1-249-404-00	CARBON	82	5%	1/4W
R22	1-249-433-11	CARBON	22K	5%	1/4W
R23	1-249-335-11	CARBON MELF	1K	5%	1/8W
R24	1-249-353-11	CARBON MELF	33K	5%	1/8W
R25	1-249-346-11	CARBON MELF	8.2K	5%	1/8W
R27	1-249-432-11	CARBON	18K	5%	1/4W
R29	1-249-347-11	CARBON MELF	10K	5%	1/8W
R31	1-249-331-11	CARBON MELF	470	5%	1/8W

Ref. No.	Part No.	Description			Remark
R32	1-249-347-11	CARBON MELF	10K	5%	1/8W
R33	1-249-347-11	CARBON MELF	10K	5%	1/8W
R34	1-249-425-11	CARBON	4.7K	5%	1/4W
R35	1-249-355-11	CARBON MELF	47K	5%	1/8W
R37	1-249-359-11	CARBON MELF	100K	5%	1/8W
R38	1-249-363-11	CARBON MELF	220K	5%	1/8W
R39	1-249-339-11	CARBON MELF	2.2K	5%	1/8W
R40	1-249-338-11	CARBON MELF	1.8K	5%	1/8W
R41	1-249-344-11	CARBON MELF	5.6K	5%	1/8W
R42	1-249-359-11	CARBON MELF	100K	5%	1/8W
R43	1-249-363-11	CARBON MELF	220K	5%	1/8W
R44	1-249-339-11	CARBON MELF	2.2K	5%	1/8W
R45	1-249-338-11	CARBON MELF	1.8K	5%	1/8W
R46	1-249-344-11	CARBON MELF	5.6K	5%	1/8W
R47	⚠ 1-249-409-11	CARBON	220	5%	1/4W
R48	1-249-359-11	CARBON MELF	100K	5%	1/8W
R49	1-249-359-11	CARBON MELF	100K	5%	1/8W
R61	1-249-359-11	CARBON MELF	100K	5%	1/8W
R62	1-249-355-11	CARBON MELF	47K	5%	1/8W
R64	1-249-351-11	CARBON MELF	22K	5%	1/8W
R65	1-249-355-11	CARBON MELF	47K	5%	1/8W
R66	1-249-073-11	CARBON MELF	1M	5%	1/5W
R67	1-249-359-11	CARBON MELF	100K	5%	1/8W
R68	1-249-352-11	CARBON MELF	27K	5%	1/8W
R69	1-249-351-11	CARBON MELF	22K	5%	1/8W
R70	1-249-331-11	CARBON MELF	470	5%	1/8W
R71	1-249-339-11	CARBON MELF	2.2K	5%	1/8W
R72	1-249-339-11	CARBON MELF	2.2K	5%	1/8W
R73	1-249-347-11	CARBON MELF	10K	5%	1/8W
R74	1-249-347-11	CARBON MELF	10K	5%	1/8W
R75	1-249-343-11	CARBON MELF	4.7K	5%	1/8W
R81	1-249-335-11	CARBON MELF	1K	5%	1/8W
R82	1-249-335-11	CARBON MELF	1K	5%	1/8W
R83	1-249-335-11	CARBON MELF	1K	5%	1/8W
R84	1-249-335-11	CARBON MELF	1K	5%	1/8W
R85	1-249-347-11	CARBON MELF	10K	5%	1/8W
R86	1-249-335-11	CARBON MELF	1K	5%	1/8W
R88	1-249-343-11	CARBON MELF	4.7K	5%	1/8W
R89	1-249-335-11	CARBON MELF	1K	5%	1/8W
R90	1-249-343-11	CARBON MELF	4.7K	5%	1/8W
R91	1-249-335-11	CARBON MELF	1K	5%	1/8W
R92	⚠ 1-249-401-11	CARBON	47	5%	1/4W
R101	1-249-341-11	CARBON MELF	3.3K	5%	1/8W
R102	1-249-332-11	CARBON MELF	560	5%	1/8W
R103	1-249-335-11	CARBON MELF	1K	5%	1/8W
R104	1-249-328-11	CARBON MELF	270	5%	1/8W
R105	1-249-343-11	CARBON MELF	4.7K	5%	1/8W
R106	1-249-339-11	CARBON MELF	2.2K	5%	1/8W
R107	1-249-343-11	CARBON MELF	4.7K	5%	1/8W

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
R108	1-249-323-11	CARBON MELF	100	5% 1/8W	
R109	1-249-343-11	CARBON MELF	4.7K	5% 1/8W	
R110	⚠ 1-249-405-11	CARBON	100	5% 1/4W	
R111	1-249-341-11	CARBON MELF	3.3K	5% 1/8W	
R112	1-249-332-11	CARBON MELF	560	5% 1/8W	
R113	1-249-335-11	CARBON MELF	1K	5% 1/8W	
R114	1-249-328-11	CARBON MELF	270	5% 1/8W	
R115	1-249-351-11	CARBON MELF	22K	5% 1/8W	
R116	1-249-339-11	CARBON MELF	2.2K	5% 1/8W	
R117	1-249-343-11	CARBON MELF	4.7K	5% 1/8W	
R118	1-249-323-11	CARBON MELF	100	5% 1/8W	
		< VARIABLE RESISTOR >			
RV21	1-238-013-11	RES, ADJ, CARBON 2.2K			(STEREO SEPARATION)
RV22	1-238-017-11	RES, ADJ, CARBON 22K (AM TUNED)			
RV24	1-238-017-11	RES, ADJ, CARBON 22K (FM TUNED)			
		< TRANSFORMER >			
T21	1-404-807-11	TRANSFORMER, DISCRIMINATOR			
		< TERMINAL >			
TM1	* 1-537-138-31	TERMINAL BOARD (ANT)			
		< CONNECTOR >			
TP1	* 1-560-060-00	PIN, CONNECTOR 2P (NULL)			
		< CRYSTAL >			
XT81	1-577-126-11	VIBRATOR, CRYSTAL (7.2MHz)			

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MISCELLANEOUS

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4	1-554-920-21	SWITCH, PUSH (AC POWER) (1 KEY)
13	⚠ 1-575-651-11	CORD, POWER
FL701	1-519-512-11	INDICATOR TUBE, FLUORESCENT
PT501	⚠ 1-450-009-11	TRANSFORMER, POWER
RV751	1-466-513-11	ENCODER, ROTARY (TUNING)

Ref. No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIAL	
		**********	
	1-501-369-11	ANTENNA	
	1-501-374-11	ANTENNA, LOOP	
	1-558-233-11	CORD (WITH CONNECTOR) (SIRCS) 4P	
	1-559-533-11	CORD, CONNECTION	
	* 3-704-343-01	SHEET (STANDARD), PROTECTION	
	3-753-281-11	MANUAL, INSTRUCTION (ENGLISH/FRENCH/SPANISH/ITALIAN)	
	3-753-281-41	MANUAL, INSTRUCTION (DUTCH/SWEDISH/PORTUGUESE/GERMAN)	
	* 4-917-074-01	CUSHION	
	* 4-944-049-11	INDIVIDUAL CARTON	

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HARDWARE LIST

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# 1	7-621-773-93	SCREW (PANEL 2.6 TP2)
# 2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
# 3	7-682-550-04	SCREW +BVTT 3X12 (S)
# 4	7-685-646-79	SCREW +BVTP 3X8 TYPE2
# 5	7-685-871-01	SCREW +BVTT 3X6 (S)

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.